

Battling Brittle Bones

Building strong bones with exercise and a balanced diet rich in calcium and Vitamin D may be the best defense against osteoporosis and low bone mass. While osteoporosis is largely preventable for most people, an estimated 44 million adults aged 50 years and older are considered to be at risk for the debilitating disease, according to the National Osteoporosis Foundation.

However, as a result of NASA know-how, millions of Americans under and above the age of 50 can rest assured with an early assessment system that provides a quick, convenient, and economical analysis to determine future fracture risk. The accuDEXA® Bone Mineral Density Assessment System, manufactured by Schick Technologies, Inc., utilizes “camera on a chip” sensor technology invented and developed by NASA’s Jet Propulsion Laboratory (JPL) that matches the abilities of costly, power-consuming charge coupled device (CCD) cameras that are considered the industry standard for high-quality imaging.

JPL’s Complementary Metal-Oxide Semiconductor Active Pixel Sensors (CMOS APS)

require one-hundredth the power of a CCD system, are lighter in weight, and are less vulnerable to radiation damage in space. These attributes helped NASA realize its goal of smaller, cheaper fabrications enabling affordable future space missions.

Photobit Corporation, a Pasadena, California-based spinoff company formed by JPL in 1995, gained intellectual property rights to the CMOS APS technology with the goal of developing and commercializing the second-generation, solid-state sensors. In 1997, Long Island City, New York-based Schick entered into an agreement with Photobit to create the new accuDEXA diagnostic tool using CMOS APS.

Schick’s accuDEXA system offers several advantages over traditional osteoporosis tests, which assess bone density loss in the hip and spine, and require specialized personnel to conduct. With accuDEXA, physicians can test the entire body’s bone density at a peripheral site, such as the finger, without applying gels or having patients remove garments. Using Dual Energy X-ray Absorptiometry (DEXA), the



Patients undergoing accuDEXA® tests are exposed to significantly less radiation than those submitted to traditional bone density testing methods.

results are achieved in 30 seconds and printed out in less than a minute, compared to the estimated examination time of 15 minutes for hip and spine density analyses.

Patients undergoing accuDEXA tests are exposed to significantly less radiation (.0003 μSv) than those submitted to traditional bone density testing methods (.1 μSv to 5.9 μSv). Effective radiation to the patient using accuDEXA is also just 1/150,000th of a chest X-ray, according to Schick. The system detects the smallest fluctuations in bone density with a precision that has a less than 1-percent margin of error. Additionally, accuDEXA's cost-effectiveness and compact size make it possible for physicians to offer the test to at-risk patients within the confines of their own offices, meaning that patients will not be inconvenienced by having to travel to an off-site radiology location.

Schick also applied the CMOS APS technology to a new software product that performs

dental radiography using up to 90-percent less radiation exposure than conventional X-rays. Called Computed Dental Radiography® (CDR), the new digital imaging product utilizes an electronic sensor in place of X-ray film to generate sharp and clear images that appear on a computer screen within 3 seconds, and can be enlarged and enhanced to identify problems. Because CDR saves and stores the images, it eliminates costs incurred by film, processing, and chemicals, and saves X-ray technicians and other medical staff from waiting for development and duplication. The product is compatible with virtually all X-ray tubes, seamlessly integrates with existing practice management systems, and allows for the correction of underexposed radiographs. ♦

accuDEXA® and Computed Dental Radiography® are registered trademarks of Schick Technologies, Inc.



Utilizing an electronic sensor, Computed Dental Radiography® delivers superior images instantly with no chemicals to handle, no hassles with duplicating images, and exposes patients to far less radiation than with film methods.